

[0512] It should be noted that dimensions, sizes, and quantities listed herein are exemplary, and the present invention is in no way limited thereto. In an exemplary embodiment of the invention, a patch-sized fluid delivery device may be approximately 6.35 cm (~2.5 in) in length, approximately 3.8 cm (~1.5 in) in width, and approximately 1.9 cm (~0.75 in) in height, although, again, these dimensions are merely exemplary, and dimensions can vary widely for different embodiments.

[0513] While the principles of the invention have been described herein, it is to be understood by those skilled in the art that this description is made only by way of example and not as a limitation as to the scope of the invention. Other embodiments are contemplated within the scope of the present invention in addition to the exemplary embodiments shown and described herein. Modifications and substitutions by one of ordinary skill in the art are considered to be within the scope of the present invention.

What is claimed is:

1. A delivery device for delivering an infusion medium to a user, the device comprising:

- a first housing portion adapted to be secured to a user;
- a second housing portion configured to be selectively engaged with and disengaged from the first housing portion;
- a drive shaft supported by the second housing portion;
- a shape-memory alloy operatively connected to the drive shaft, to selectively move the drive shaft; and
- a pump device comprising:

- a housing provided with a barrel, a port extending to the barrel and configured for connection to a reservoir, the port in fluid flow communication with the barrel and configured for connection in fluid flow communication with an injection site;

- a plunger located in the barrel and having a surface for receiving a drive force from the drive shaft when the first housing portion and the second housing portion are engaged,

wherein the plunger is moveable with movement of the drive shaft along the longitudinal axis of the barrel between fill and dispense positions, such that:

- in the fill position, the plunger is moved to a position to allow fluid flow communication through the port and into the barrel; and

- in the dispense position, the plunger is moved to a position wherein fluid flow is obstructed through the port and to reduce the volume of the barrel to force fluid in the piston chamber out of the port.

2. A delivery device according to claim 1, wherein the housing of the pump device further comprising an outlet chamber in fluid flow communication with the barrel and the port, and wherein the pump device further comprises a one-way valve between the barrel and the outlet chamber and arranged to allow fluid flow from the barrel to the outlet chamber and inhibit fluid flow from the outlet chamber to the barrel.

3. A delivery device according to claim 1, further comprising a reservoir having an interior volume for containing an infusion medium and a conduit connecting the interior volume of the reservoir in fluid flow communication with the port of the housing of the pump device.

4. A delivery device according to claim 3, wherein the reservoir is supported by the first housing portion.

5. A delivery device according to claim 1, further comprising electrical control circuitry contained in the second housing portion, wherein the electrical control circuitry controls the drive device for delivery of the infusion medium from the reservoir to the user when the first housing portion and the second housing portion are engaged.

6. A delivery device according to claim 1, wherein the first housing portion comprises a base portion having a bottom surface and an adhesive material on the bottom surface for securing the first housing portion to the skin of the user.

7. A delivery device according to claim 1, wherein the first housing portion comprises a base portion having a bottom surface securable to the skin of the user, the delivery device further comprising an injection site at which a hollow needle or cannula may be inserted into a user's skin when the bottom surface of the base portion is secured to the user's skin, and a conduit coupling the injection site in fluid flow communication with the outlet port of the pump device.

8. A delivery device according to claim 7, further comprising a one-way valve within the conduit.

9. A delivery device according to claim 1, further comprising a conduit coupled to the port of the pump device, and a one-way valve within the conduit.

10. A pump device for conveying a fluidic medium, the pump device comprising:

- a housing provided with a barrel, a port extending to the barrel and configured for connection to a reservoir, the barrel in fluid flow communication with the channel and the port in fluid flow communication with the barrel and configured for connection in fluid flow communication with an injection site; and

- a plunger located in the barrel and having a surface for receiving a drive force from a drive shaft;

wherein the plunger is moveable along the longitudinal axis of the piston channel between fill and dispense positions upon receiving a force from a drive shaft, such that:

- in the fill position, the plunger is moved to a position to allow fluid flow communication through the port and into the barrel; and

- in the dispense position, the plunger is moved to a position to obstruct fluid flow communication through the port and to reduce the volume of the barrel to force fluid in the barrel out of the port.

11. A pump device according to claim 10, wherein the housing further comprising an outlet chamber in fluid flow communication with the barrel and the outlet port, and wherein the pump device further comprises a one-way valve between the barrel and the outlet chamber and arranged to allow fluid flow from the barrel to the outlet chamber and inhibit fluid flow from the outlet chamber to the barrel.

12. A pump device according to claim 10, wherein the pump device is supported in a housing structure of an infusion delivery device having a shape-memory alloy operatively coupled to the drive shaft for driving the drive shaft to apply the drive force to the surface of the plunger.

13. A pump device according to claim 12, wherein the housing structure of the infusion delivery device comprises:

- a disposable housing portion adapted to be secured to a user;

- a durable housing portion configured to be selectively engaged with and disengaged from the disposable housing portion to allow disposal of the disposable